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a1  
further comprising data storage storing an arrangement pattern of the flip-chip bumps on the semiconductor chip.

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Please add new claims 13 and 14 as follows:

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a2  
--13. The apparatus of claim 7, wherein the support is a conveying plate transporting the semiconductor chip to the predetermined location for printing the pattern on the flip-chip bumps.--

--14. The apparatus of claim 13, wherein the conveying plate transports a plurality of semiconductor chips successively arranged thereon to the predetermined location for printing the pattern.--

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#### REMARKS

This amendment is being filed in response to the Official Action dated November 21, 2002. For the following reasons, this application should be considered in condition for allowance and the case passed to issue.

Claim 6 was rejected under 35 U.S.C. § 102(e) as being anticipated by Eldridge. Claims 7-10 were rejected under 35 U.S.C. § 103(a) as being obvious over Eldridge in view of Master et al. Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Eldridge in view of Hayes. These rejection are hereby traversed and reconsideration and withdrawal thereof are respectfully requested.

Initially, applicants state that:

**Application 09/617,104 and Patent No. 6,098,867 to Master et al. were, at the time the invention of Application 09/617,104 was made, owned by Advanced Micro Devices, Inc.**

As stated in M.P.E.P. 706.02(1)(2), the above statement alone is sufficient evidence to disqualify Master et al. from being used in a rejection under 35 U.S.C. § 103(a) against the

claims of the current application. Accordingly, the rejection of claims 7-10 under 35 U.S.C. §103(a) should be reconsidered and withdrawn. Claim 7 has been amended to incorporate the limitations of claim 6 such that claim 7 and claims 8-10 are in condition for allowance. Claims 13 and 14 have been added to depend from claim 7 and contain the same limitations as claims 11 and 12. These claims also should be in condition for allowance. Such action is respectfully requested. Hence, the following discussion refers to the rejections of claims 6 and 11-12.

The present invention relates to an apparatus for depositing flux on a semiconductor chip, the apparatus comprising a support for positioning the semiconductor chip at a predetermined location for depositing flux, the semiconductor chip having a plurality of flip-chip bumps arranged on its surface. The apparatus comprises a jet printing head for printing a flux pattern, on the flip-chip bumps, the flux pattern substantially identical to an arrangement pattern of the plurality of flip-chip bumps on the semiconductor chip, such that the flux is deposited substantially only on the flip-chip bumps.

It is incumbent upon the Examiner to maintain a rejection based on anticipation to show that a prior art reference discloses identically each and every element of the claimed invention. This burden has not been satisfied by the Examiner as Eldridge fails to disclose each and every element identically to that of the present invention. In particular, the rejection asserted by the Examiner states that Eldridge discloses

the jet printing head 10 for printing a flux pattern (column 8, lines 28-33, please note that flux is used in soldering for removing oxide from the work piece), on the flip-chip bumps (not shown), the flux pattern substantially identical to arrangement pattern of the plurality of the flip-chip bumps on the semiconductor chip, such that the flux is deposited only substantially on the flip-chip bumps.

Conspicuously absent from the Examiner's assertion of what Eldridge discloses, is any reference to a specific passage in Eldridge that indicates where tacky fluxes are to be deposited, whether the flux pattern is substantially identical to an arrangement pattern with a

plurality of flip-chip bumps on the semiconductor chip, and whether such flux is deposited substantially on the flip-chip bumps. A review of Eldridge does not reveal any disclosure of the providing of flux onto flip-chip bumps. Nor is there any disclosure that the flux is deposited in a pattern substantially identical to the arrangement pattern of the plurality of flip-chip bumps on a semiconductor chip so that the flux is deposited substantially on the flip-chip bumps. To say that Eldridge discloses these features is merely supposition and not supported by the facts. Eldridge merely describes material that can be ejected and lists as one example of these many materials, tacky and etching fluxes (see column 8, line 33). There is no description of the depositing of the tacky and etching fluxes on flip-chip bumps, nor is there any discussion of the flux pattern being substantially identical to the arrangement pattern of the plurality of the flip-chip bumps. There is no support in Eldridge for making such a statement. In order to anticipate claim 6 of the present invention, Eldridge must identically disclose each and every element of the claimed invention. Eldridge clearly fails to identically disclose the claimed features. As such, reconsideration and withdrawal of the rejection of claim 6 under 35 U.S.C. §1 02(e) are respectfully requested.

Claim 11 and 12 further depend from and limit claim 6. Hayes fails to disclose any of the features deficient in Eldridge as noted above, and therefore the combination of references cannot make obvious claims 11 and 12 under 35 U.S.C. §103(a). Reconsideration and withdrawal of the rejection of these claims are therefore respectfully requested.


In light of the amendments and remarks above, this application should be considered in condition for allowance and the case passed to issue. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

Attached hereto is a marked-up version of the changes made to the specification and the claims by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

A marked up version of the claims showing amendments appears below, along with the current status of the claims still pending in the application.

1. (Not Amended) A method for depositing flux on a semiconductor chip, the method comprising the steps of:

determining an arrangement pattern of a plurality of flip-chip bumps formed on a surface of a semiconductor chip; and

jet printing a flux pattern on the flip-chip bumps, the flux pattern corresponding substantially identically to the arrangement pattern of the plurality of flip-chip bumps.

2. (Not Amended) The method of claim 1, further comprising the step of transporting the semiconductor chip to a predetermined location for jet printing the flux pattern on the flip-chip bump.

3. (Not Amended) The method of claim 2, wherein the step of transporting the semiconductor chip further comprises the step of transporting a plurality of semiconductor chips successively to the predetermined location for jet printing the flux pattern.

4. (Not Amended) The method of claim 1, wherein the step of determining the arrangement pattern further comprises the steps of:

transforming the arrangement pattern of the plurality of flip-chip bumps into computer-recognizable data; and

storing the computer-recognizable data in data storage.

5. (Not Amended) The method of claim 4, wherein the step of jet printing the flux pattern further comprises the steps of:

determining the flux pattern based on the computer-recognizable data stored in the data storage; and

jet printing the flux pattern to selectively deposit flux substantially only on the plurality of flip-chip bumps.

6. (Not Amended) An apparatus for depositing flux on a semiconductor chip, the apparatus comprising:

a support for positioning the semiconductor chip at a predetermined location for depositing flux, the semiconductor chip having a plurality of flip-chip bumps arranged on its surface; and

a jet printing head for printing a flux pattern, on the flip-chip bumps, the flux pattern substantially identical to an arrangement pattern of the plurality of flip-chip bumps on the semiconductor chip, such that the flux is deposited substantially only on the flip-chip bumps.

7. (Amended) An apparatus for depositing flux on a semiconductor chip, the apparatus comprising:

a support for positioning the semiconductor chip at a predetermined location for depositing flux, the semiconductor chip having a plurality of flip-chip bumps arranged on its surface; and

a jet printing head for printing a flux pattern, on the flip-chip bumps, the flux pattern substantially identical to an arrangement pattern of the plurality of flip-chip

bumps on the semiconductor chip, such that the flux is deposited substantially only on the flip-chip bumps [The apparatus of claim 6,] further comprising data storage storing an arrangement pattern of the flip-chip bumps on the semiconductor chip.

8. (Not Amended) The apparatus of claim 7, wherein the arrangement pattern is stored in computer-recognizable data in the data storage.

9. (Not Amended) The apparatus of claim 8, wherein the jet printing head prints the flux pattern based on the computer-recognizable data stored in the data storage.

10. (Not Amended) The apparatus of claim 7, wherein the jet printing head is capable of printing a plurality of flux patterns corresponding to a plurality of arrangement patterns of flip-chip bumps of semiconductor chips by storing the plurality of arrangement patterns in the data storage.

11. (Not Amended) The apparatus of claim 6, wherein the support is a conveying plate transporting the semiconductor chip to the predetermined location for printing the pattern on the flip-chip bumps.

12. (Not Amended) The apparatus of claim 11, wherein the conveying plate transports a plurality of semiconductor chips successively arranged thereon to the predetermined location for printing the pattern.

--13. (New) The apparatus of claim 7, wherein the support is a conveying plate transporting the semiconductor chip to the predetermined location for printing the pattern on the flip-chip bumps.--

--14. (New) The apparatus of claim 13, wherein the conveying plate transports a plurality of semiconductor chips successively arranged thereon to the predetermined location for printing the pattern.--